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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,059	06/29/2001	Debashis Bhattacharya	162.7107USU	9475

7590 09/29/2004  
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EXAMINER
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THOMPSON, ANNETTE M

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/896,059

**Applicant(s)**

BHATTACHARYA ET AL.

**Examiner**

A. M. Thompson

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-19, 21-36, 38-44, 46-52, 54-59 and 61-69 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-19, 21-36, 38-44, 46-52, 54-59 and 61-69 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06/29/2001; 07/02/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application, 09/896,059, after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 25 June 2004 has been entered.

2. Claims 1, 9, 11, 19, 21, 29, 30, 31, 39, 47, and 54 are amended. Claims 10, 20, 37, 45, 53, and 60 are cancelled. Claims 62-69 are added. Claims 1-9, 11-19, 21-36 38-44, 46-52, 54-59 and 61-69 are pending.

### ***Drawings***

3. The drawings are objected to: In **Figure 3**, remove narrative and place in specification at page 16 where Figure 3 is discussed or alternatively, incorporate the narration into the Brief Description of the Drawings. Additionally Figure 3, is objected to as failing to comply with 37 CFR 1.84(p)(5) because it does not include the reference sign 315 (denoting the intercell) mentioned in the description. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary,

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the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claims 14, 42, 67 and 68 are objected to because of the following informalities: Pursuant to claims 14, 42 it is not "the control module" that is repeated; rather it is the steps of characterizing and selecting. Pursuant to claim 68, it should depend from claim 67. Pursuant to claim 67, before criteria, insert - -design metric- - to establish a structural functional connection for claim 69. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 9, 19, 29, and 36, 52** are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are between design metric and the optimizing and designing steps.

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Applicants must clarify what the design metrics are and how they relate to the design objectives and design-specific cell. Examiner suggests editing the phrase in the base claims which recites "from the group consisting of . . ." to read - *-from the group of design metrics consisting of. . . -*; alternatively in the base claims before "criteria" insert - *-design metric- -*. Pursuant to claim 36, insert --design metric- - before "criteria", insert the complete "wherein" clause of claim 36 into claim 31 to establish the *design metric* connection and cancel claim 36 (because it would now be redundant). Pursuant to claim 52, insert --design metric- - before "criteria", insert the complete "wherein" clause of claim 52 into claim 47 to establish the *design metric* connection and cancel claim 52 (because it would now be redundant). Similar claim constructions exist

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### **Rejection of claims 1 and 2**

8. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Shubat et al. (Shubat), U.S. Patent 6,051,031.

9. Pursuant to claim 1, Shubat discloses a method for designing integrated circuits (Abstract) comprising describing the IC (col. 7, ll. 29-32), the description including at

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least one design objective of the IC (col. 7, ll. 34-38; col. 6, line 66 to col. 7, line 11); partitioning the description into at least one functional block (col. 7, ll. 32-35); generating at least one design specific cell representative of said functional block, wherein the design-specific cell is a transistor-level cell and said design-specific cell is generated based on said design objective of said IC (col. 7, ll. 35-38; col. 7, ll. 60-64).

10. Pursuant to claim 2, wherein said step of generating comprises evaluating the design specific cell based on a context of use for the cell (col. 7, ll. 35-38, wherein flexibility in module size is the context of use).

**Rejection of claims 1-9, 11-19, 30-36 38-44, 46, 54-59 and 61-69**

11. Claims 1-9, 11-19, 30-36, 38-44, 46, 54-59 and 61-69 are rejected under 35 U.S.C. 102(e) as being anticipated by Kumashiro et al. (Kumashiro), U.S. Patent 6,301,692.

12. Pursuant to claim 1, Kumashiro discloses a method for designing integrated circuits (Abstract; col. ll. 20-22) comprising describing the IC (Fig. 1, #101), the description including at least one design objective of the IC (col. 4, ll. 3-15; col. 3, ll. 60-64); partitioning the description into at least one functional block (Fig. 1, #102; col. 12, ll. 27-33); generating at least one design specific cell representative of said functional block, wherein the design-specific cell is a transistor-level cell and said design-specific cell is generated based on said design objective of said IC (Fig. 1, #110).

13. Pursuant to claim 2, wherein said step of generating comprises evaluating the design specific cell based on a context of use for the cell (See Fig. 2; col. 13, ll. 30-46).

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Pursuant to claim 3, wherein generating comprises characterizing and selecting the design-specific cell from a minimal set comprising at least one cell, based on the IC design objective (Fig. 1, #111-115; Fig. 18).

14. Pursuant to claim 4, wherein the step of characterization and selecting is repeated until the design objective is met (Fig. 1 illustrates an iteration condition based on the decision of #115).

15. Pursuant to claim 5, wherein the design objective is selected from a group consisting of IC design size, die area, performance, power consumption, routability, fault tolerance, signal integrity, testability, reliability and cost (Abstract, last line; col. 21, ll. 1-18).

16. Pursuant to claim 6, further comprising a step of optimizing the IC design (Fig. 1, # 111-114).

17. Pursuant to claim 7, wherein a criteria for the step of optimizing is selected from the group consisting of clock speed, transistor sizing, number of transistors, power consumption, fault tolerance, signal integrity characteristics, noise characteristics, and a combination thereof (col. 7, ll. 25-30; col. 15, ll. 22-25).

18. Pursuant to claim 8, wherein said step of optimizing is performed automatically (col. 3, line 55 to col. 4, line 12; see also Fig. 1).

19. Pursuant to claim 9, wherein said optimizing is repeated until said IC design meets at least one design metric (Figure 1, step 115 illustrates the decision step of an iterative optimization).

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20. Pursuant to claims 11-19, these claims recite a system for implementing the automated design process recited in claims 1-9 and incorporate many of the recited limitations. The fifth embodiment of Kumashiro (col. 19, line 15 to col. 21, line 18) discloses the claimed system limitations; additionally col. 25, ll. 8-14 discloses a processing system. Therefore claims 11-19 are likewise rejected based at least on the reasoning of claims 1-9.

21. Pursuant to claims 30, 62-69, and 54-59 and 61, these claims recite a storage medium with computer readable program instructions for automatically designing an IC using the claimed method of claims 1-9, supra. Kumashiro also discloses the limitation of a storage medium with computer readable instructions in claims 26, 27 and additionally at col. 25, ll. 9-13). Therefore, claims 30, 62-69 are likewise rejected.

22. Pursuant to claims 31-36 and 38, these claims incorporate the limitations already rejected in claims 1-5 and 7, respectively (wherein claim 1 contains the limitations of Applicants' claim 31 and 38) and are likewise rejected based on the same reasoning, supra.

23. Pursuant to claims 39-44 and 46, these claims incorporate the limitations already rejected in claims 11-19, respectively (wherein claims 11 contains the limitations of Applicants' claims 39 and 46) and are likewise rejected based on the same reasoning, supra.

**Rejection of claims 21-29 and 47-52**

24. Claims 21-29 and 47-52 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kumashiro.

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25. Pursuant to claims 21-29 and claims 47-52, these claims recite a design-specific cell produced by the process recited in claims 1-9. Kumashiro discloses design specific transistor-level cells in the eighth embodiment (col. 25, line 17 to col. 26, line 8), ninth embodiment (col. 26, line 10 to col. 28, line 23), tenth embodiment (col. 28, line 25 to col. 29, line 11) and eleventh embodiment (col. 29, line 13 to col. 30, line 62). All of these design specific cells are produced by the process claimed and already rejected in claims 1-9, supra. Therefore, claims 21-29 and claims 47-52 are likewise rejected.

***Conclusion***

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please reference the attached PTO-892.

27. Any inquiry concerning this communication or earlier communications should be directed to Examiner A.M. Thompson whose telephone number is (571) 272-1909. The Examiner can usually be reached Monday thru Friday from 8:00 a.m. to 4:30 p.m..

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

28. Responses to this action should be mailed to the appropriate mail stop:

Mail Stop \_\_\_\_\_

Commissioner for Patents

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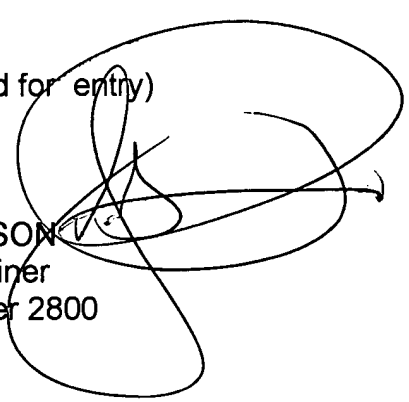
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A large, stylized handwritten signature in black ink is written over the printed name and title of the Primary Examiner. The signature is highly cursive and loops around the text.